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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

GOOGLE LLC,

Plaintiff and Counter-defendant,

v.

SONOS, INC.,

Defendant and Counter-claimant.

Case No. 3:20-cv-06754-WHA
Related to Case No. 3:21-cv-07559-WHA

DECLARATION OF DR. KEVIN C. ALMEROTH IN SUPPORT OF SONOS, INC.'S MOTION FOR SUMMARY JUDGMENT OF INFRINGEMENT OF '885 PATENT CLAIM 1

Date: June 9, 2022
Time: 8:00 a.m.
Place: Courtroom 12, 19th Floor
Judge: Hon. William Alsup

Complaint Filed: September 28, 2020

FILED UNDER SEAL

I, Kevin C. Almeroth, hereby declare as follows:

I. INTRODUCTION

1. I am a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB), where I have been a faculty member for nearly 25 years. I am also a founding member of the Media Arts and Technology Program, Technology Management Program, and the Computer Engineering Program, and I previously served as the Associate Director of the Center for Information Technology and Society. During my tenure at UCSB, my research has focused on topics including data networks and protocols (including wireless data networks such as those compliant with IEEE 802.11), multimedia systems, delivery of multimedia content and other data across data networks, mobile applications, and multicast communication.

2. In conjunction with my research at UCSB, I have been involved in academic research into available technology in the marketplace. This includes my involvement in the Internet Engineering Task Force including many content delivery-related working groups. I also have involvement with several other technical organizations, including the Association of Computing Machinery and the Institute of Electrical and Electronics Engineers, and I am an author or co-author of approximately 200 technical papers, published software systems, IETF Internet Drafts and IETF Request for Comments.

3. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June, 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June, 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia System, minor in Telecommunications Public Policy) earned in June, 1997.

II. SCOPE OF ASSIGNMENT AND INFORMATION CONSIDERED

4. I have been asked by Sonos, Inc. ("Sonos") to provide my opinions on whether claim 1 of U.S. Patent 10,848,885 (the "'885 Patent") is directly infringed by Google LLC ("Google") in connection with Sonos's motion for summary judgment of infringement that is

scheduled to be filed on April 14, 2022. The billing rate for my services related to this matter is $700 per hour. My compensation is in no way contingent on the outcome of this action.

5. The language of claim 1 of the '885 Patent is set forth below:

[1.0] A first zone player comprising:
[1.1] a network interface that is configured to communicatively couple the first zone player to at least one data network;
[1.2] one or more processors;
[1.3] a non-transitory computer-readable medium; and
[1.4] program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the first zone player to perform functions comprising:

> **[1.5]** while operating in a standalone mode in which the first zone player is configured to play back media individually in a networked media playback system comprising the first zone player and at least two other zone players:
>
> > **[1.6]** (i) receiving, from a network device over a data network, a first indication that the first zone player has been added to a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked; and
> >
> > **[1.7]** (ii) receiving, from the network device over the data network, a second indication that the first zone player has been added to a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the second zone player is different than the third zone player;
>
> **[1.8]** after receiving the first and second indications, continuing to operate in the standalone mode until a given one of the first and second zone scenes has been selected for invocation;
> **[1.9]** after the given one of the first and second zone scenes has been selected for invocation, receiving, from the network device over the data network, an instruction to operate in accordance with a given one of the first and second zone scenes respectively comprising a given one of the first and second predefined groupings of zone players; and
> **[1.10]** based on the instruction, transitioning from operating in the standalone mode to operating in accordance with the given one of the first and second predefined groupings of zone players such that the first zone player is configured to coordinate with at least one other zone player in the given one of the first and second predefined groupings of zone players over a data network in order to output media in synchrony with output of media by the at least one other zone player in the given one of the first and second predefined groupings of zone players.

6. I understand that Sonos has accused Google of directly infringing claim 1 of the

'885 Patent by virtue of making, using, offering to sell, selling, and/or importing certain media players that incorporate Google's "Cast" technology (sometimes referred to as "Chromecast" technology) for audio receivers (sometimes referred to as "Cast receivers"), which are Google's (1) Chromecast media players, (2) Chromecast Ultra media players, (3) Chromecast with Google TV media players, (4) Home media players, (5) Home Mini media players, (6) Home Max media players, (7) Nest Audio media players, (8) Nest Mini media players, (9) Nest Hub media players (which were formerly branded as "Home Hub" media players[1]), (10) Nest Hub Max media players, and (11) Nest Wifi Point media players. I will refer to these media players as the "Accused Google Players."

7. As part of my infringement analysis, I also looked at how the Accused Google Players interact with other devices, such as smartphones, tablets, or computers, that are installed with software applications incorporating Google's Cast technology for senders (sometimes referred to as "Cast senders"). These Cast-enabled software applications, which include the Google Home app, the YouTube Music app, the Google Play Music app, and the Spotify app, among others, can be used to control the Accused Google Players. I will refer to a smartphone, tablet, or computer installed with any one or more of these Cast-enabled software applications as a "Google Controller."

8. I understand that the timeframe of Google's alleged infringement of the '885 Patent began on November 24, 2020 when the '885 Patent issued and continues until the present day, and I have focused my infringement analysis on this timeframe.

9. I have a methodology that I follow when performing this kind of infringement analysis. As part of that methodology, I started with a review of the '885 Patent and its prosecution history as well as the parties' claim construction positions that are relevant to claim 1 of the '885 Patent. These claim construction positions are reflected in the claim construction charts, the claim construction briefing, and other related materials that have been filed to date in the present case, which is Case No. 3:20-cv-6754, as well as *Sonos, Inc. v. Google LLC*, No. 3:21-cv-7559 ("N.D.

[1] *See, e.g.*, GOOG-SONOSWDTX-00005229 at 29 ("[W]e're bringing the Home products under the Nest brand …. Nest Hub (formerly Google Home Hub).").

Cal. Case No. 3:21-cv-7559"), which is related to the present case and was transferred from the Western District of Texas to this Court on September 27, 2021.

10. Next, I evaluated the structure and operation of the Accused Google Players. That evaluation involved a review of various materials regarding the Accused Google Players, including Google's source code, internal and publicly available documents, certain of Google's discovery responses in the present case, including Google's Responses to Sonos's Interrogatory Nos. 5 and 13 and Google's Responses to Sonos's Request for Admissions (RFAs) Nos. 1-12, as well as certain deposition and trial testimony from the International Trade Commission (ITC) Investigation that was initiated by Sonos against Google in January 2020 in connection with these same Accused Google Players. I have also used the Accused Google Players and have overseen and directed testing of the Accused Google Players to gain a further understanding of the structure and operation of the Accused Google Players.

11. Further, I reviewed the parties' contentions related to infringement of claim 1 of the '885 Patent, including Sonos's Infringement Contentions relating to claim 1 of the '885 Patent, and Google's Response to Sonos's Interrogatory No. 12 as it relates to claim 1 of the '885 Patent.

12. A more detailed identification of the materials that I reviewed while evaluating the Accused Google Players and formulating my opinions regarding infringement can be found in the paragraphs that follow, as well as in Exhibit 1.

13. Once I completed my evaluation of the Accused Google Players, I then compared the Accused Google Players to claim 1 of the '885 Patent in order to determine whether the Accused Google Players meet every limitation of claim 1 of the '885 Patent.

III. SUMMARY OF OPINIONS

14. Based on my analysis, it is my opinion that each of the Accused Google Players identified above literally satisfies every limitation of claim 1 of the '885 Patent. Further, I have been informed that Google makes, uses, offers to sell, and/or sells each of the Accused Google Players identified above in the United States, and/or imports each of the Accused Google Players identified above into the United States. For these reasons, it is my opinion that Google directly infringes claim 1 of the '885 Patent.

IV. LEGAL STANDARDS

15. I understand that a party directly infringes a patent whenever the party makes, uses, offers to sell, or sells a patented invention in the United States, or imports a patented invention into the United States, without authorization to do so from the patent holder.

16. I understand that, as the patent holder, it is Sonos's burden to prove direct infringement of claim 1 of the '885 Patent by a preponderance of evidence. To do so, Sonos must show that it is more likely than not that the Accused Google Players meet each and every limitation of claim 1 of the '885 Patent. In this respect, if even one limitation of claim 1 of the '885 Patent is not met by the Accused Google Players, then I understand that Google will not be liable for direct infringement.

17. As shown above, claim 1 of the '885 Patent is directed to a "first zone player" (i.e., a device) having certain hardware limitations, including "a network interface that is configured to communicatively couple the first zone player to at least one data network," "one or more processors" and "a non-transitory computer-readable medium," and then additionally requires "program instructions stored on the non-transitory computer-readable medium that, when executed by the one or more processors, cause the first zone player to perform [the claimed] functions" that follow. I understand that an accused device will meet the functional limitations of a device claim structured in this way as long as the accused device is installed with software that makes it *capable* of performing the claimed functions. In this respect, the accused device need not be plugged in, connected to a network, placed into a system with other devices, or actually be used in a manner that causes the device to perform the claimed functions in order to meet the functional limitations of the device claim. Thus, it is my understanding that claim 1 of the '885 Patent is met by an Accused Google Player as long as the Accused Google Player (i) meets the hardware limitations of the claim and (ii) is installed with software that provides the Accused Google Player with the capability to perform the functional limitations of the claim.

V. LEVEL OF ORDINARY SKILL IN THE ART

18. In my opinion, a person of ordinary skill in the art ("POSITA") for purposes of this action is a person having the equivalent of a four-year degree from an accredited institution

(typically denoted as a B.S. degree) in computer science, computer engineering, electrical engineering, or an equivalent thereof, and approximately 2-4 years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience. Based on my personal knowledge and extensive experience in the fields of networking and multimedia systems, including the configuration and control of networked devices, I am very familiar with the level of knowledge and abilities of a POSITA at the time of the inventions.

VI. OVERVIEW OF THE '885 PATENT

19. The '885 Patent is directed to Sonos's "zone scene" technology, which, at the time of the invention, provided a new way of organizing and using networked media players such as smart speakers, which are referred to in the patent as "zone players." The technology disclosed in the '885 Patent enables a user to create and save a predefined group of zone players that can *later* be invoked to cause zone players in the previously-saved, predefined group to become configured to play back audio in synchrony. The '885 Patent calls such a previously-saved, predefined group a "zone scene."

20. Figure 1 of the '885 Patent is an example of a networked multi-zone playback system in which the "zone scene" technology can be used. As shown in Figure 1, the exemplary system incudes media players ("zone players") 102, 104, 106 and "controlling devices" 140, 142 coupled to a "data network" 108 (e.g., a home Wi-Fi network):

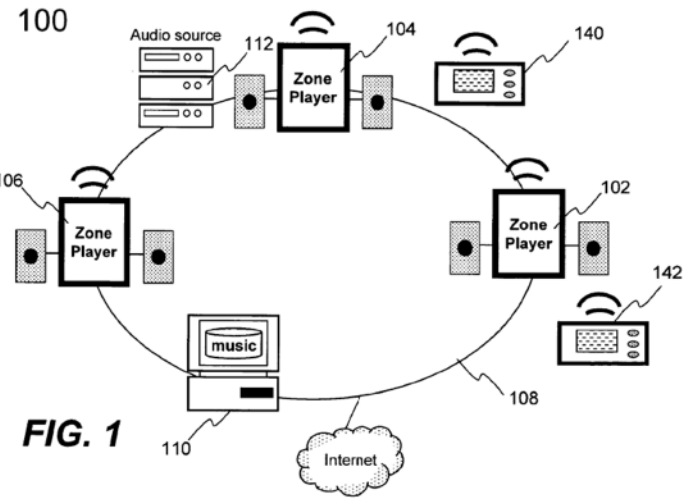


FIG. 1

'885 Patent at Fig. 1, 4:39-5:2, 6:28-30.

21. The '885 Patent explains that, in addition to communicating with each other and with other devices on "data network" 108, each "zone player" is configured to communicate over a "wide area network" (e.g., the Internet) with one or more remote audio sources (e.g., an Internet-based audio source like Spotify or YouTube Music) to, for example, retrieve audio for playback on one or more "zone players" in the system. *See, e.g., id.* at 4:66-5:9, FIG. 1.

22. Before the '885 Patent, conventional multi-speaker systems were inflexible and cumbersome to use. Some were essentially "a collection of many stereo systems" each with its own local audio source, making it "difficult" to share music across different areas of the home. *Id.* at 1:53-55. Other systems offered a central source of music connected to speakers located in different rooms in the home, but these components were physically "hard-wired" together using conventional stereo wires. *Id.* at 1:62-65. That made it difficult, if not impossible, to rearrange the system to suit different user preferences.

23. Take, for example, a user who likes to listen to the news in the morning. They have speakers in different rooms of their house. This person might want to listen to the morning news while getting ready for work by playing the news on speakers in their bedroom, bathroom, and den. *Id.* at 1:65-2:3. But the same person might want to listen to music (e.g., jazz) after dinner in the evening by playing an album in their den and living room. *Id.* at 2:3-5. The two desired groups in this example are different, but both include the den. Using traditional audio systems, it was "difficult … to accommodate the requirement of dynamically managing the ad hoc creation and deletion of groups" because those systems were hard-wired and pre-configured. *Id.* at 2:15-17.

24. Sonos's '885 Patent solved this problem by allowing users to create different speaker groupings that were durable in the sense that the system could remember the groups, but easy to use in the sense that they could be selected for invocation by a user at any time. *See, e.g., id.* at 3:14-31, 8:47-61, 10:30-11:5. In this way, a user could use a networked controller to predefine different, customized groupings of speakers called "zone scenes," and easily start listening to music synchronously on any of them.

25. Not only did Sonos's "zone scene" technology solve problems that existed in conventional hard-wired audio systems, the '885 Patent also explains how Sonos's "zone scene" technology was different from the grouping mechanism that was currently used by Sonos when the '885 Patent was filed, which required a user to define the group of zone players "on the fly" at the time the user wished to listen to audio playback in synchrony across multiple zone players, which "may be sometimes quite time consuming." *See, e.g., id.* at 8:42-45, 8:54-56.

26. To facilitate the use of these "zone scenes," the '885 Patent discloses a controller with a user interface via which a user can create and save a "zone scene" for future use and then later select that "zone scene" for invocation via the controller. *See, e.g., id.* at 3:14-31, 8:47-61, 10:30-11:5. The'885 Patent illustrates various exemplary user interfaces that can be provided via a controller device for performing these tasks. For example, Figure 5A of the '885 Patent shows an exemplary user interface that allows a user to create and save a new "zone scene" named "Morning":

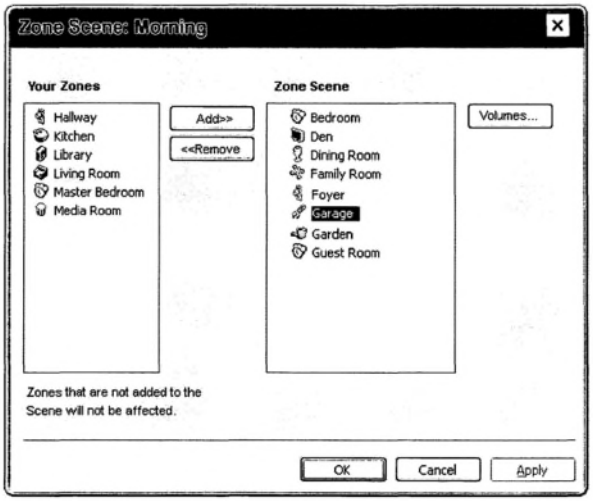


FIG. 5A

Id. at Fig. 5A.

27. The ability to assign the name "Morning" to this "zone scene" allows the user to expressly indicate that this "Morning" "zone scene" includes "zone players" on which to listen to audio in synchrony in the morning. *See, e.g., id.* at 8:47-61, 10:30-41; *see also id.* at 3:1-25. Other exemplary "zone scene" names contemplated in the '885 Patent include, for example,

afternoon, evening, and garden. *Id.* at 8:47-9:15.

28. Figure 7 of the '885 Patent illustrates an exemplary user interface that enables a previously-saved "zone scene" to be selected for invocation. As shown in this example, the "zone scene" named "Morning Wakeup," which is represented by the "Morning Wakeup" icon, can be selected for invocation:

Id. at Fig. 7.

29. As explained further below, claim 1 of the '885 Patent covers aspects of Sonos's "zone scene" technology from the perspective of a zone player.

VII. OVERVIEW OF ACCUSED GOOGLE PLAYERS

30. As noted, I have been asked to consider whether certain of Google's products meet every limitation of claim 1 of the '885 Patent. In particular, I have been asked to evaluate the Accused Google Players, specifically, Google's Home Mini, Nest Mini, Home, Nest Audio, Home Max, Nest Hub (formerly known as the Home Hub), Nest Hub Max, Nest Wifi Point, Chromecast, Chromecast Ultra, and Chromecast with Google TV media players.

31. All the Accused Google Players are wireless media players that incorporate Google's "Cast" (sometimes called "Chromecast") technology, which enables the Accused Google Players to utilize Google's "Cast Protocol" to communicate with smartphones, tablets, or other computer devices installed with Cast-enabled apps, such as Google's Google Home app,

Google's Google Play Music app[2], Google's YouTube Music app, and the Spotify app. *See, e.g.*, Google's Resp. to Sonos's Interrog. No. 13 at 9-11; GOOG-SONOSWDTX-00005793-802; GOOG-SONOSNDCA-00056732-77. As described below, these Cast-enabled apps help facilitate setup and/or control of the Accused Google Players, including the creation and use of groups of smart speakers. Herein, a computer device (e.g., smartphone, tablet, or laptop) installed with any one or more of these Cast-enabled apps is referred to as a "Google Controller."

32. The Cast technology incorporated into the Accused Google Players enables each Accused Google Player to operate in one of two mutually exclusive modes at any given time: (1) a mode in which the Accused Google Players are configured to play back audio individually [redacted] or (2) a mode in which the Accused Google Players are configured to play back media in synchrony with one or more other Accused Google Players as part of a group [redacted] GOOG-SONOSNDCA-00056732-77.

33. Further, the Cast technology incorporated into the Accused Google Players supports two different types of groups: (1) a "speaker group," [redacted] which is a grouping of Accused Google Players for synchronous playback that is [redacted], and (2) a "dynamic" group, which is a grouping of Accused Google Players for synchronous playback that [redacted] *See, e.g.*, Google's Third Suppl.

[2] Google discontinued the Google Play Music app in late 2020.

Resp. to Sonos's Interrog. No. 13 at 9-11 ([redacted] GOOG-SONOSWDTX-00048393. I have focused my infringement analysis on Google's "speaker group" type of grouping functionality.

34. To facilitate the creation and control of a speaker group, Google provides a free software application called the Google Home app, which can be installed on a user's personal computer device, typically a smartphone. According to Google, the Google Home app allows a user to create and save speaker groups. GOOG-SONOSWDTX-00007068; GOOG-SONOSWDTX-00048962 at 62, 64-65; SONOS-SVG2-00055660. Then, after a speaker group is created and saved, a user can cause a previously-saved, predefined "speaker group" to be invoked ([redacted]) at any time by selecting the group via a Google Controller using either the Google Home app itself or other Cast-enabled media content streaming apps, such as Google's Google Play Music app, Google's YouTube Music app, and the Spotify app. *Id.*; *see also* Section IX.

35. As explained further below, a user can create and save as many "speaker groups" as desired, including groups that have one or more overlapping Accused Google Players. Also, a user has the flexibility to name a "speaker group" anything. For example, a user can name a "speaker group" according to a time of day (e.g., "morning" and "afternoon") or an area of a user's home (e.g., "garden"), among others.

36. I have not seen any evidence that would indicate any relevant changes to the structure or operation of the Accused Google Players during the timeframe of Google's alleged infringement of claim 1 of the '885 Patent (which as noted above began on November 24, 2020 and continues until the present day).

VIII. OVERVIEW OF GOOGLE SOURCE CODE

37. As noted above, part of my infringement analysis involved a review of the source code that Google has made available for inspection in this case, which includes source code corresponding to the firmware of the Accused Google Players that incorporate Google's Cast

technology, as well as certain Google apps that incorporate Google's Cast technology.

38. With respect to the source code for the firmware of Accused Google Players, I focused my review on the source code [redacted] *See* Google's Resp. to Sonos's Interrog. No. 5 at 11-13. I have also reviewed printouts of certain portions of the source code [redacted] have been produced by Google in this case.

39. My understanding is that the source code [redacted] (which as noted above began on November 24, 2020 and continues until the present day). Further, my understanding is that the source code [redacted] *See, e.g.*, Google's Resp. to Sonos's Interrog. No. 5 at 11-13 (setting forth a chart of firmware versions for the Accused Google Players); 10/1/2020 K. MacKay Dep. Tr. from ITC Inv. No. 337-TA-1191, at 67:22-71:1 ([redacted]).

40. With respect to the source code for the Google apps, I focused my review on the source code in [redacted].

41. My understanding is that the source code in these directories for the Android versions of the Google Home, YouTube Music, and Google Play Music apps is representative of the relevant source code for the Android versions of the Google Home, YouTube Music, and Google Play Music apps throughout the entire timeframe of Google's alleged infringement of the '885 Patent. Further, my understanding is that the source code in these directories for the Android versions of the Google Home, YouTube Music, and Google Play Music apps is representative of the source code used by Google to build the Android versions of the Google Home, YouTube Music, and Google Play Music apps that were made available for download in the United States throughout this entire timeframe of Google's alleged infringement of the '885 Patent, although I understand that the Google Play Music app was discontinued at some point during that timeframe.

IX. TESTING OF ACCUSED GOOGLE PLAYERS

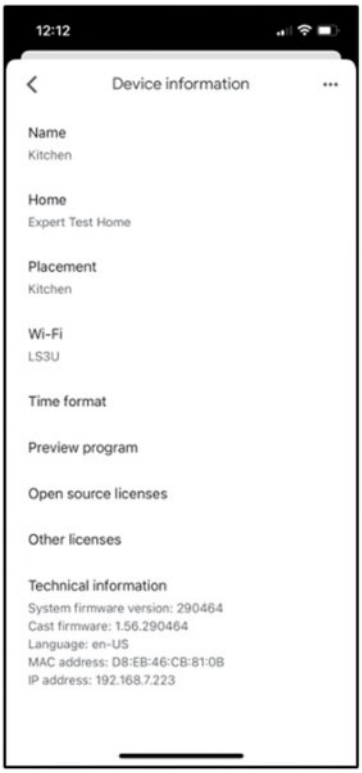
42. As noted above, part of my infringement analysis involved overseeing and directing certain testing of the Accused Google Players to further understand the structure and operation of the Accused Google Players. I memorialized my observations during this testing of a networked media playback system comprising exemplary Accused Google Players that I understand are representative of the structure and operation of all of the Accused Google Players, as well as exemplary Google Controllers that I understand are representative of the operation of all Google Controllers. In particular, the specific networked media playback system that was primarily used for testing, which I refer to as the "Google test system," included the following:

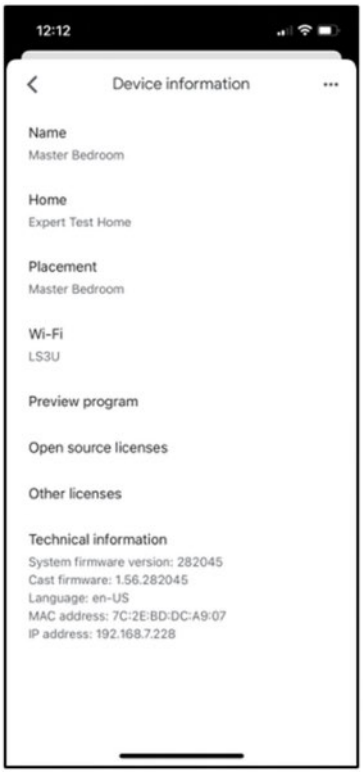
- A first Accused Google Player comprising a Nest Hub player running Cast firmware version 1.56.290464, which was named "Kitchen"
- A second Accused Google Player comprising a Home mini player running Cast firmware version 1.56.282045, which was named "Master Bedroom"
- A third Accused Google Player comprising a Nest Audio player running Cast firmware version 1.54.279716, which was named "Living Room"
- One Google Controller comprising a Pixel 4XL device running Android version 12 that was installed with the Google Home (version 2.48.75.6), YouTube Music (version 4.70.50), and Spotify (version 8.7.18.1138) apps for Android, which I will refer to below as the "Android-based Google Controller"
- Another Google Controller comprising an iPhone 12 Pro device running iOS version 15.4.1 that was installed with the Google Home (version 2.50.105), YouTube Music

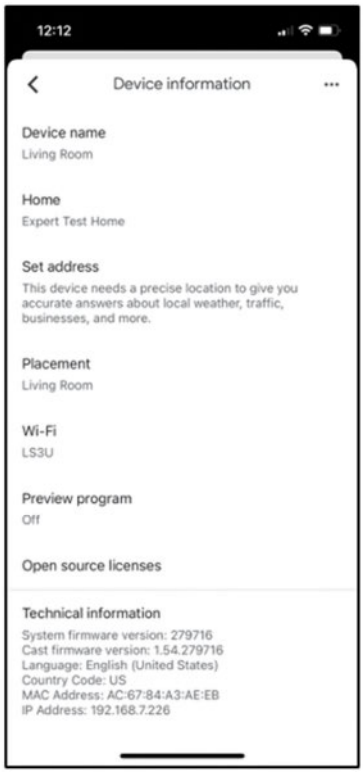
(version 5.01.1), and Spotify (version 8.7.20.1724) apps for iOS, which I will refer to below as the "iOS-based Google Controller"

43. Unless otherwise specified below, the screenshots shown were captured by the iOS-based Google Controller.

44. Prior to testing, each of the three exemplary Accused Google Players was factory reset and then set up using the Google Home app. During that setup process, the three exemplary Accused Google Players were added to a home named "Expert Test Home" and connected to the same Wi-Fi network. Below are screenshots of Google Home app's "Device settings" page for each of the three Accused Google Players after setup:

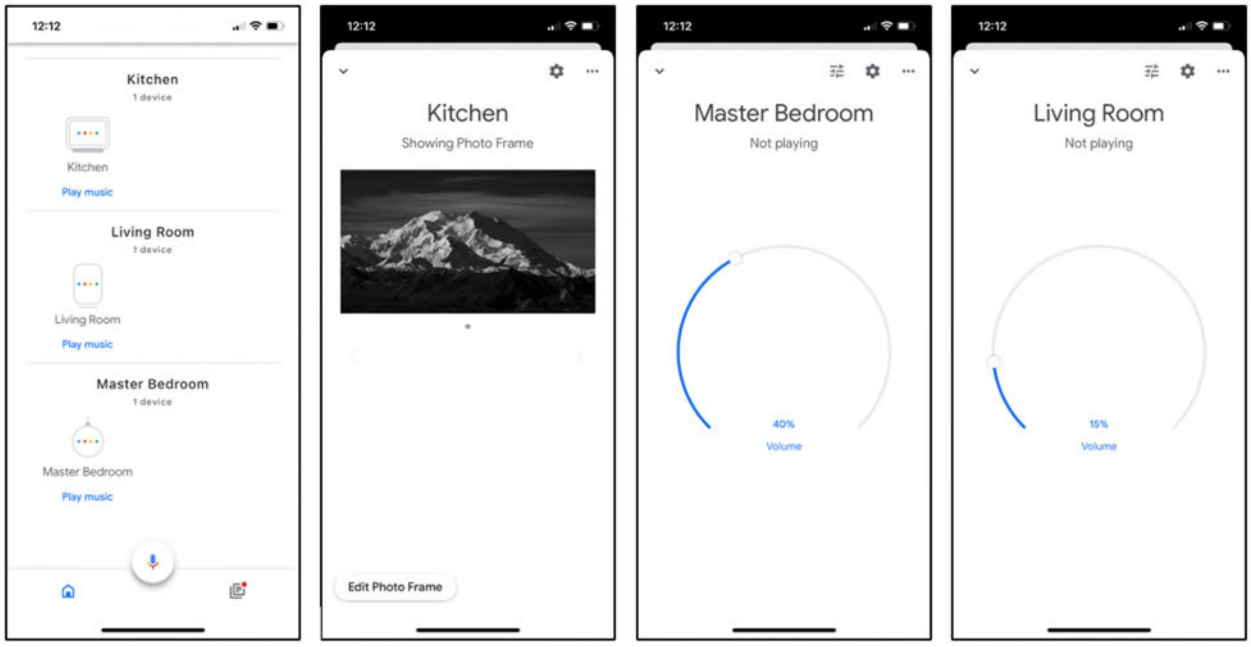






45. After the three exemplary Accused Google Players were set up, I also observed that it was possible to add other Accused Google Players to the Google test system as well. For example, after the three exemplary Accused Google Players were tested in the manner described below, I also oversaw the use and testing of various other Accused Google Players that were later added to the Google test system, including a Home player, a Home Max, Nest Hub Max, a Chromecast, and a Chromecast with Google TV, and I observed that these other Accused Google players all functioned similarly to the three exemplary Accused Google Players.

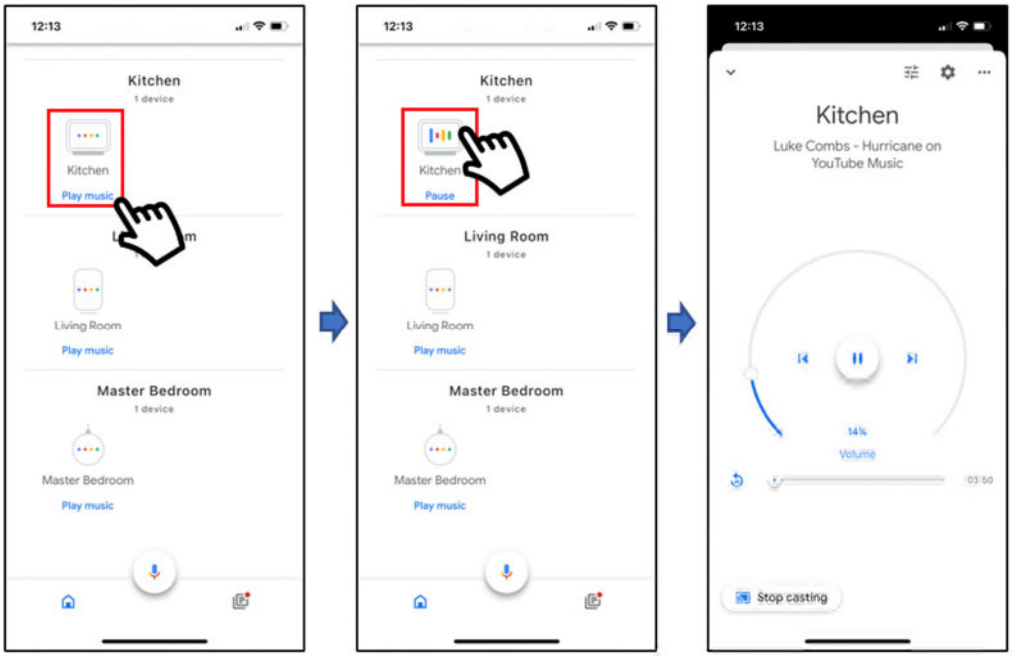
46. After the three exemplary Accused Google Players were set up, I observed that each of the three exemplary Accused Google Players initially began operating in a standalone mode in which the Accused Google Player was configured to play back audio individually, as opposed to a grouped mode in which the Accused Google Player was configured to play back audio as part of a group of Accused Google Players. Below are screenshots of the Google Home app that show this initial state of the Google test system after the Accused Google Players were set up:



As shown in the first screenshot on the left, a "Play music" button was provided for each of the Accused Google Players, indicating that none of them were actively engaging in playback but that a user could start playing audio on any of those players individually if desired.

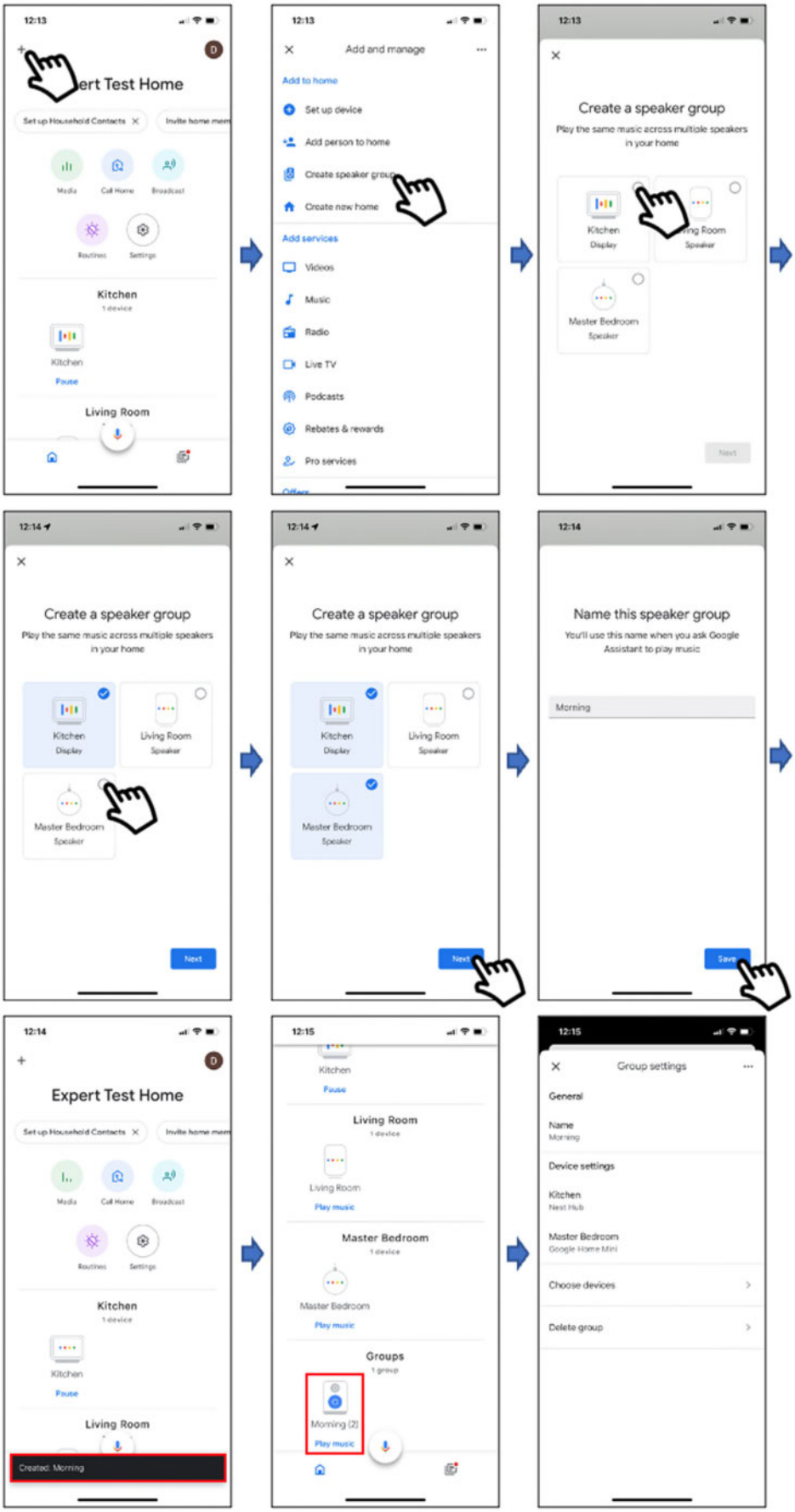
47. While each of the three Accused Google Players was operating in standalone mode in which the Accused Google Player was configured to play back audio individually, I confirmed that it was possible for an Accused Google Player to engage in active playback of audio content. I oversaw testing of this functionality for each of the Accused Google Players using several different Cast-enabled apps, including the Google Home app, YouTube Music app, and Spotify app. Below are some exemplary Google Home app screenshots that were captured during this testing to show that, while configured to play back audio individually, the first

Accused Google Player is capable of engaging in active playback of audio content:

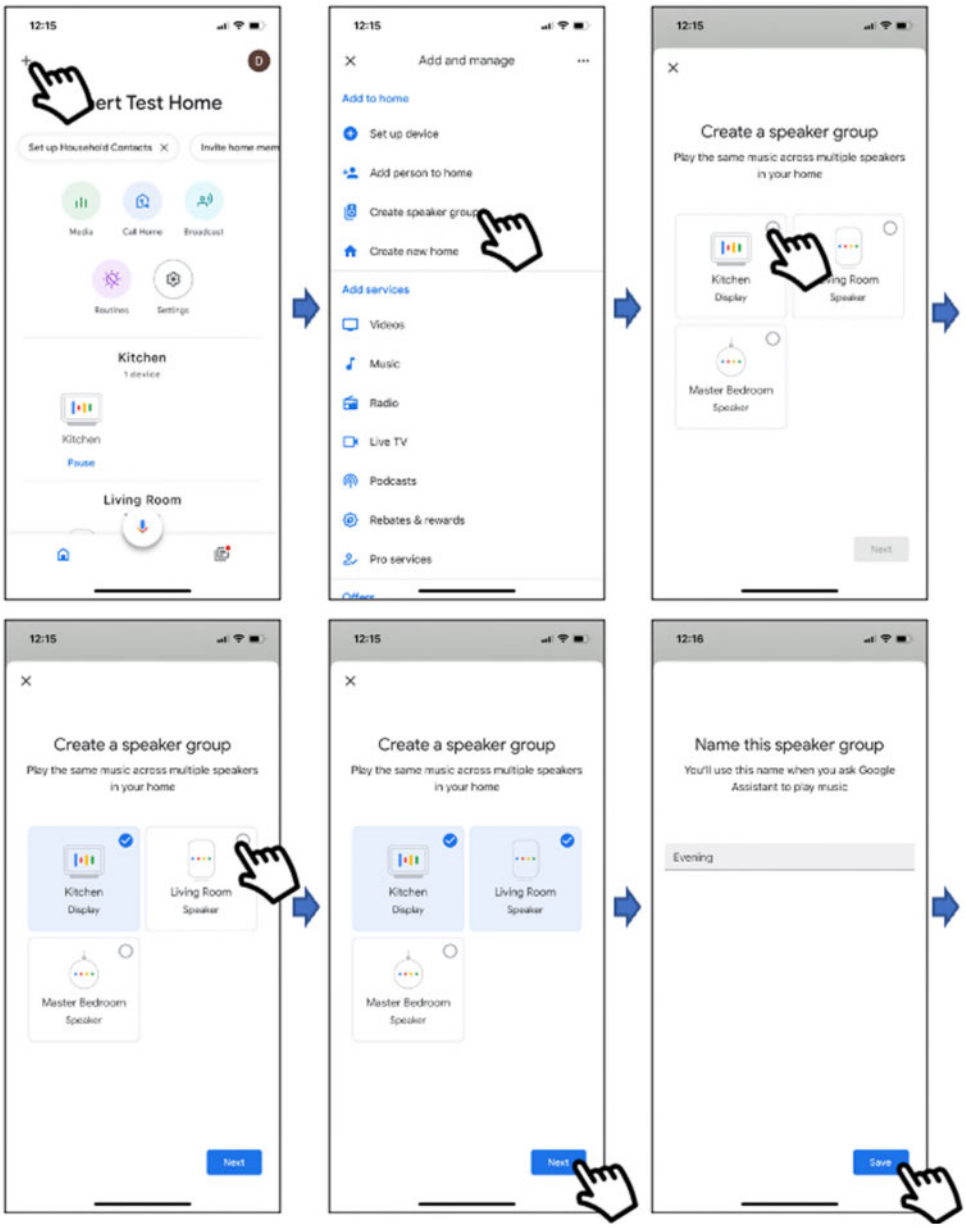


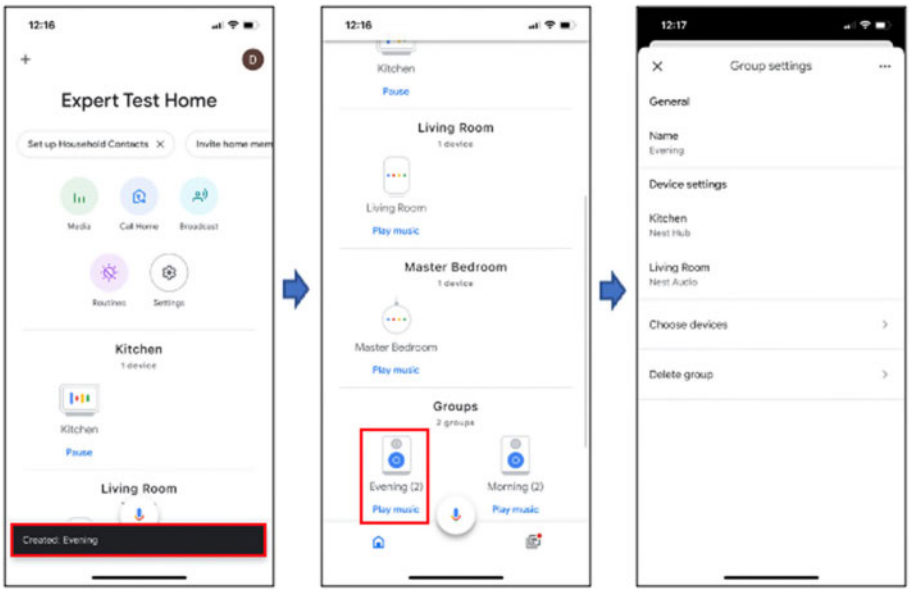
As shown, after the "Play music" button was selected, the "Play music" button was replaced with a "Pause" button, indicating that the "Kitchen" player was now actively engaging in playback. I also audibly observed that only the 'Kitchen" player was outputting sound.

48. While each of the three Accused Google Players was operating in standalone mode and the "Kitchen" player was engaging in active playback of audio content, I then oversaw testing of the functionality provided by Google's Cast technology for creating speaker groups. To start, the Google Home app on the iOS-based Google Controller was used to create a first speaker group that included the "Kitchen" and "Master Bedroom" players, which was saved under the name "Morning." Below are screenshots of the Google Home app that were captured to show the process of creating this first speaker group:


Add and manage
Add to home
Set up device
Add person to home
Create speaker group
Create new home
Add services
Videos
Music
Radio
Live TV
Podcasts
Rebates & rewards
Pro services
Create a speaker group
Play the same music across multiple speakers in your home
Kitchen
Living Room
Master Bedroom
Next
Name this speaker group
You'll use this name when you ask Google Assistant to play music
Morning
Save
Expert Test Home
Created: Morning
Groups
Morning (2)
Group settings
General
Name
Device settings
Choose devices
Delete group

49. Next, the Google Home app on the iOS-based Google Controller was used to create a second speaker group that included the "Kitchen" and "Living Room" players, which was saved under the name "Evening." Below are screenshots that were captured to show the process of creating this second speaker group:





50. There are several notable things that I observed during the process of creating and saving these two speaker groups. First, I observed that the act of creating and saving a new speaker group does *not* change the operating mode of the Accused Google Players that are placed into the speaker group – the three exemplary Accused Google Players that were selected for inclusion in these new speaker groups each continued to operate in standalone mode even after the speaker groups were created, as opposed to transitioning into a grouped mode, and the "Kitchen" player also continued to engage in active playback of audio content while in standalone mode. This continued standalone mode operation demonstrates that a speaker group is a grouping of Accused Google Players that is not [redacted] at the time of creation, but rather is predefined and saved for future use, which enables the previously-saved, predefined grouping to be selected for launch at a later time.

51. Second, I observed that it is possible to include the same Accused Google Player as a member in multiple different speaker groups having different memberships. Specifically, in the case of the Google test system, the "Kitchen" player was included in both of the first and second speaker groups, whereas the "Master Bedroom" player was only included in the "Morning" speaker group and the "Living Room" player was only included in the "Evening" speaker group. This ability to include the same Accused Google Player in multiple different speaker groups is a byproduct of the fact that each of the speaker groups is a previously-saved,

predefined grouping of Accused Google Players that persists even during times when the speaker group is not [redacted]

52. Third, I observed that Google's Cast technology provides a user with the flexibility to name a speaker group anything. For instance, the first speaker group that was created and saved was named "Morning," which indicates that this is a grouping of Accused Google Players that was created and saved for use during a morning time of day, and the second speaker group that was created and saved was named "Evening," which indicates that this is a grouping of Accused Google Players that was created and saved for use during an evening time of day. However, these are just two possible examples, and I confirmed that it was possible to create and save speaker groups that have other types of names as well.

53. Fourth, I observed that after a speaker group was created and saved using one Google Controller (e.g., the iOS-based Google Controller), I was able to view and access that previously-saved speaker group on a different Google Controller (e.g., the Android-based Google Controller). I confirmed this was the case even in a scenario where the Google Controller used to create the speaker group was disconnected from the Wi-Fi network after creating the speaker group and then a different Google Controller was subsequently connected to the Wi-Fi network. This is consistent with the other evidence I have seen demonstrating that, after a new speaker group is created via a Google Controller, the Google Controller being used to create the speaker group [redacted]

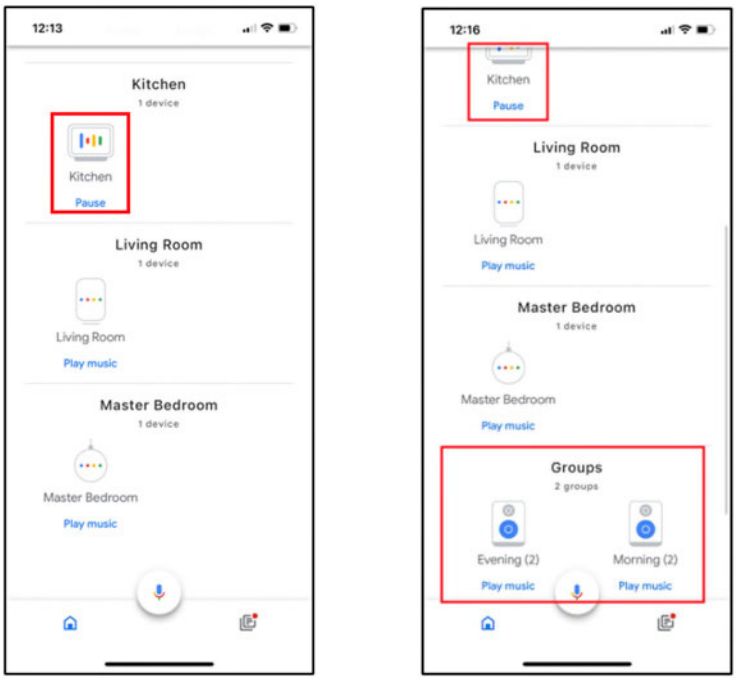
54. Although not reflected in the screenshots, I also oversaw testing of the process of creating and saving these same two speaker group configurations (i.e., a "Morning" speaker

group including the first and second Accused Google Players and an "Evening" speaker group including the first and third Accused Google Players) in various other scenarios, and my observations above held true in those other scenarios as well.

55. For example, I oversaw testing of the process of creating and saving these same two speaker group configurations in scenarios where all of the exemplary Accused Google Players were in standalone mode and none of them were engaging in active playback, as well as scenarios where all of the Accused Google Players were in standalone mode and the "Master Bedroom" and/or "Living Room" players were engaging in active playback. In all such scenarios, the process of creating and saving the two speaker group configurations worked in the same way described above – each Accused Google Player continued to operate in standalone mode (as opposed to transitioning to a grouped mode) after the speaker groups were created, and any Accused Google Player that was engaging in active playback individually while in standalone mode then continued to engage in that active individual playback even after the speaker groups were created and saved.

56. Although not reflected in the screenshots, I also oversaw testing of the group creation functionality discussed above in scenarios where the "Morning" and "Evening" speaker groups were created via the Android-based Google Controller, and I did not observe any meaningful difference in that group creation functionality when using the Android-based Google Controller as compared to the iOS-based Google Controller.

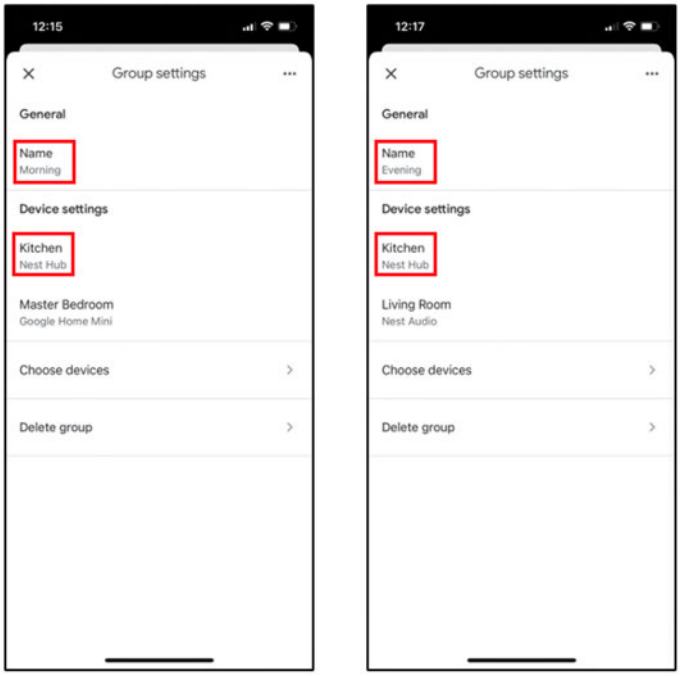
57. Returning to the scenario discussed above where the first and second speaker groups were created while the "Kitchen" player was engaging in active playback of audio content while in standalone mode, below are screenshots of the Google Home app that show the state of the Google test system both before (on left) and after (on right) the first and second speaker groups were created and saved:



These screenshots show a few different things. First, both before and after the groups were created, the "Pause" playback button was presented below the "Kitchen" player (indicating that the "Kitchen" player was actively engaging in playback and could be paused), while a "Play music" button was presented below the other players (indicating that the "Living Room" and "Master Bedroom" players were not actively engaging in playback but that a user could start playing audio on those players if desired). I also audibly observed that only the "Kitchen" player was outputting sound both before and after the groups were created. Second, the right screenshot shows that the first and second speaker groups have now been predefined, saved, and are available for future use, but at this point in the workflow, each Accused Google Player is still operating in a standalone mode in which it is configured to play back audio individually (and the Kitchen player is still engaging in active individual playback), as opposed to a grouped mode in which the Accused Google Player is configured to play back audio as part of any speaker group. Third, the right screenshot shows that, after the groups were created, icons were presented for each of the "Morning" and "Afternoon" groups along with a respective "Play music" button (indicating that a user could invoke either group for synchronous playback if desired).

58. Below are screenshots of the "Group settings" pages for the first and second

speaker groups, illustrating that the Kitchen player was a member of both groups, while the Master Bedroom player was only a member of the Morning group and the Living Room player was only a member of the Evening group:

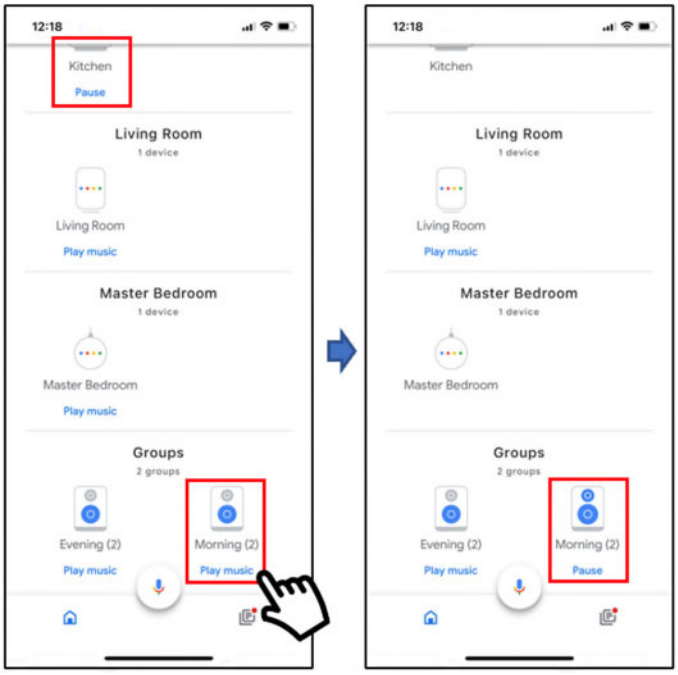


59. After the first and second speaker groups were saved, I then oversaw testing of the functionality provided by Google's Cast technology for launching a speaker group for synchronous audio playback. Based on that testing, I observed that there were many different ways to initiate a [redacted] of a previously-saved speaker group for synchronous audio playback, including from the Google Home app itself, from the YouTube Music app, and from the Spotify app, among other possibilities. Additionally, I observed that a previously-saved speaker group could be [redacted] in any of various different scenarios – including but not limited to (i) scenarios where all of the Accused Google Players were operating in standalone mode and the "Kitchen" player was engaging in active playback, (ii) scenarios where all of the Accused Google Players were operating in standalone mode and none of them were engaging in active playback of audio content, and (iii) scenarios where all of the Accused Google Players were operating in standalone mode and the "Master Bedroom" and/or "Living Room" players were engaging in active playback of audio content.

60. Below are screenshots that were captured during this testing to show some

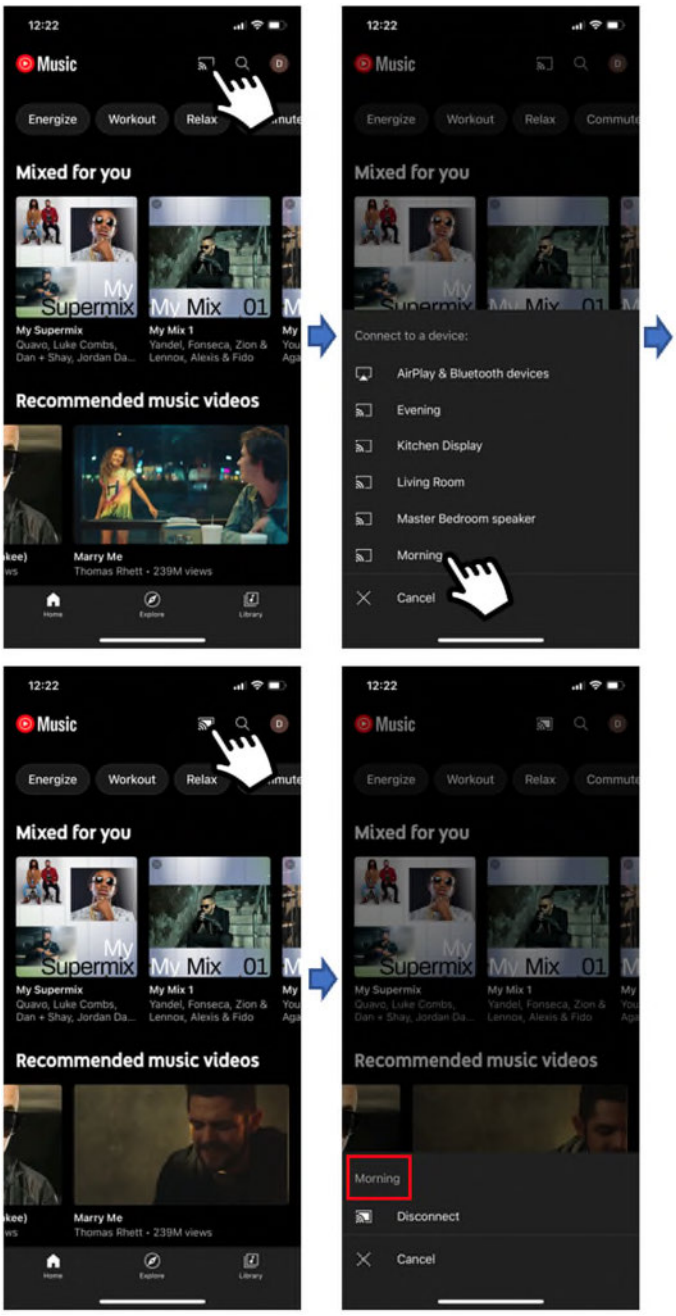
representative examples of the different ways to initiate the [redacted] of a previously-saved speaker group for synchronous playback.

61. This first set of screenshots shows an example where the "Morning" speaker group was selected for [redacted] via the Google Home app's main page in a scenario where all of the Accused Google Players were operating in standalone mode and the "Kitchen" player was engaging in active playback of audio content:



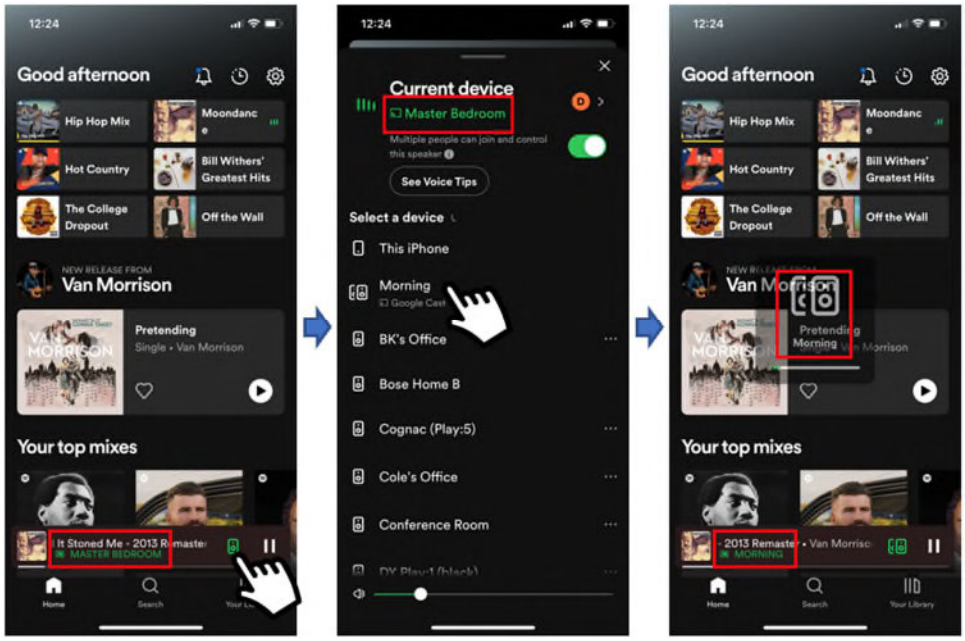
As shown, after selecting the "Play music" button corresponding to the Morning group, the "Play music" button was replaced with a "Pause" button, indicating that the Morning group was now actively engaging in synchronous playback and could be paused if desired.

62. This second set of screenshots shows an example where the "Morning" speaker group was selected for [redacted] via the YouTube Music app in a scenario where all of the Accused Google Players were operating in standalone mode and none of them were previously engaging in active playback:



As shown, after selecting the Morning group from the list of available devices in the second screenshot, the Cast icon at the top of the third screenshot turns to solid white and, in the fourth screenshot, the YouTube Music App indicates that music is being played on the Morning group.

63. This third set of screenshots shows an example where the "Morning" speaker group was selected for [redacted] via the Spotify app in a scenario where all of the Accused Google Players were operating in standalone mode and the "Master Bedroom" player was engaging in active playback of audio content:



As shown in the third screenshot, after selecting the Morning group from the list of available devices in the second screenshot, the Spotify app indicates that music is being played on the Morning group by flashing a multi-speaker icon in the middle of the screen and then identifying the Morning group in green along with the music that is being played by the Morning group.

64. There are several notable things that I observed during this testing of the aforementioned functionality for initiating the [redacted] of a speaker group for synchronous playback. First, as explained above, each time a speaker group was selected for [redacted] the interface of the app that was used to select the speaker group provided a visual indication (and in some cases, an audible indication as well) that the Accused Google Players in the selected speaker group had begun to operate in accordance with that speaker group.

65. Second, after a speaker group had been [redacted] and active playback had begun on that launched speaker group, it sounded to me as though the Accused Google Players in the [redacted] speaker group were outputting audio in synchrony with one another, which confirmed that the Accused Google Players in the speaker group had become configured to output audio in synchrony with one another after the speaker group was selected for [redacted]

66. As a first example, after the "Morning" speaker group was selected for [redacted] via the Google Home app, the "Kitchen" and "Master Bedroom" players automatically began engaging in active playback, and it sounded to me as though the "Kitchen" and "Master

Bedroom" players were outputting audio in synchrony with one another. As a second example, after the "Morning" speaker group was selected for [redacted] via the YouTube Music app, the "Kitchen" and "Master Bedroom" players automatically began engaging in active playback, and it sounded to me as though the "Kitchen" and "Master Bedroom" players were outputting audio in synchrony with one another. As a third example, after the "Morning" speaker group was selected for [redacted] via the Spotify app while the "Master Bedroom" player was engaging in active playback, the "Kitchen" player and the "Master Bedroom" player took over playback responsibility for that active playback and it sounded to me as though the "Kitchen" and "Master Bedroom" players were outputting audio in synchrony with one another.

67. This observation that the Accused Google Players in a speaker group become configured to output audio in synchrony with one another after the speaker group is selected for launch at a Google Controller is consistent with the other evidence I have seen demonstrating that, [redacted]

68. I also oversaw testing of the group [redacted] functionality discussed above in connection with the "Evening" speaker group, and I similarly observed that the "Kitchen" and "Living Room" players in the "Evening" speaker group become configured to output audio in synchrony with one another after the "Evening" speaker group is selected for [redacted] at a Google Controller.

69. I reserve my right to conduct a demonstration of the above functionality and/or to present additional screenshots illustrating the use and testing of the above functionality.

X. INFRINGEMENT ANALYSIS OF CLAIM 1 OF THE '885 PATENT

70. The following section sets forth a detailed discussion of my infringement analysis for claim 1 of the '885 Patent and the opinions I have reached based on that analysis. This section is broken down into three sub-sections. First, I explain my analysis and opinions as to whether a Google "speaker group" amounts to a "zone scene" as that term is used throughout claim 1 of the '885 Patent. Second, I walk through my analysis and opinions regarding infringement of claim 1 of the '885 Patent on a limitation-by-limitation basis.

71. As explained in detail below, it is my opinion that each Accused Google Player literally meets each and every limitation of claim 1 of the '885 Patent. In particular, it is my opinion that a Google "speaker group" is a claimed "zone scene," and that each Accused Google Player is a claimed "zone player" that (i) includes all of the hardware limitations of claim 1 of the'885 Patent and (ii) is installed with software that makes each Accused Google Player capable of performing all of the functions recited in claim 1 of the'885 Patent. Further, as noted above, I have been informed that Google makes, uses, offers to sell, and/or sells each of the Accused Google Players identified above in the United States, and/or also imports each of the Accused Google Players identified above into the United States. For these reasons, it is my opinion that Google directly infringes claim 1 of the '885 Patent.

A. "Zone Scene"

72. Claim 1 of the '885 Patent includes several limitations that require functionality related to a "zone scene," including:

> **[1.6]** (i) receiving, from a network device over a data network, a first indication that the first zone player has been added to a first ***zone scene*** comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first ***zone scene*** is invoked; and
>
> **[1.7]** (ii) receiving, from the network device over the data network, a second indication that the first zone player has been added to a second ***zone scene*** comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second ***zone scene*** is invoked, wherein the second zone player is different than the third zone player;
>
> **[1.9]** after the given one of the first and second ***zone scenes*** has been

> selected for invocation, receiving, from the network device over the data network, an instruction to operate in accordance with a given one of the first and second ***zone scenes*** respectively comprising a given one of the first and second predefined groupings of zone players;

73. As such, the question of whether a Google speaker group is a "zone scene" is a threshold issue for infringement of claim 1 of the '885 Patent, and I address this threshold issue before turning to my limitation-by-limitation analysis.

74. With respect to claim construction, I understand that Sonos is proposing a construction for the term "zone scene" of "a previously-saved grouping of zone players that are to be configured for synchronous playback of media when the zone scene is invoked." In this respect, I note that Sonos's proposed construction is very similar to the definition of a "zone scene" that is set forth in the express claim language, which recites that each "zone scene" comprises a "predefined grouping of zone players including at least [two zone players] that are to be configured for synchronous playback of media when the . . . zone scene is invoked."

75. On the other hand, I understand that Google is advocating for the Court to adopt a preliminary construction of "zone scene" that was preliminarily offered by Judge Alan Albright during a *Markman* hearing held in the Western District of Texas before this action was transferred to the present Court, which would require "a previously saved grouping of zone players according to a common theme."

76. In my opinion, a Google speaker group is a "zone scene" under either party's proposed construction of that term.

77. As explained above, a Google speaker group constitutes a previously-saved grouping of Accused Google Players (which are "zone players" as discussed below) that is predefined in advance of the speaker group being invoked for synchronous playback and constitutes a particular set of Accused Google Players to be configured for synchronous playback of audio when the speaker group is invoked. In particular, a Google speaker group is a particular grouping of Accused Google Players for synchronous audio playback that is initially predefined by a user during a workflow for creating the speaker group, but is not [redacted] at the time of creation. Instead, the predefined grouping of Accused Google Players is assigned a name and then

saved for future use by a user. Thereafter, a user can access and select the previously-saved speaker group for launch, which activates the speaker group's predefined grouping of Accused Google Players and causes those Accused Google Players to become configured for synchronous audio playback. I have formulated this understanding of a Google speaker group based on various evidence I have reviewed during my infringement analysis.

78. For instance, Google's website includes a help page for the Accused Google Players entitled "Create and manage speaker groups," which explains that a Google speaker group allows a user to "[g]roup any combination of Google Nest or Google Home speakers and displays and Chromecast devices together for synchronous music throughout the home" and provides instructions for creating a speaker group via a Google Controller that concludes with the user entering a "name" for the speaker group and then selecting a "Save" option in order to save the speaker group for future use. GOOG-SONOSWDTX-00007068-74 at 68; *see also* SONOS-SVG2-00055660-61. The workflow for creating a speaker group via the Google Home app is shown in a Google marketing video titled "How to create a Speaker Group." *See* SONOS-SVG2-00055112; SONOS-SVG2-00055113.

79. [redacted]

[redacted]

80. Further yet, in Google's Third Supplemental Response to Sonos's Interrogatory No. 13, Google explains that [redacted] Google's Third Suppl. Resp. to Sonos's Interrog. No. 13 at 9-11.

81. As discussed above, I also confirmed during testing that a Google speaker group is a grouping of Accused Google Players that is predefined, named, and saved by a user for future use, where the Accused Google Players included in the speaker group are not configured in accordance with the speaker group (and thus are not configured for synchronous audio playback) unless and until the speaker group is invoked at a user's request. *See* Section IX.

82. The foregoing evidence establishes that a Google speaker group is "a previously-saved grouping of zone players that are to be configured for synchronous playback of media when the zone scene is invoked," and thus is a "zone scene" under Sonos's proposed construction.

83. For similar reasons, the foregoing evidence likewise establishes that a Google speaker group satisfies the first part of Google's construction, which is a "previously saved grouping of zone players." The only additional limitation in Google's proposed construction of "zone scene" is that the "previously saved grouping of zone players" be "according to a common theme." I understand that Google has interpreted the phrase "according to a common theme" in this proposed construction to impose a requirement that the "zone scene" include some kind of "theme" information, which Google has also referred to as "thematic information." *See, e.g.*, N.D. Cal. Case No. 3:21-cv-7559, D.I. 64 at 12-15 (June 1, 2021). For example, I understand that Google has identified names reflecting a specific time of day (e.g., "morning" and "afternoon") and names reflecting a specific area of a user's home (e.g., "garden") as "theme" information that would satisfy the "according to a common theme" aspect of Google's proposed construction. *Id.*

84. While Google has identified these specific examples of "theme" information, it is not clear what Google's position is on whether other types of names would amount to "theme"

information. However, to the extent Google intends to argue that only these specific types of names constitute "theme" information, I disagree with such a narrow interpretation of the word "theme." I do not see anything in either Claim 1 of the '885 Patent or the specification of the '885 Patent that restricts the types of names that may be used to identify a "zone scene," and I disagree that the plain and ordinary meaning of the word "theme" is limited only to the specific types of names that Google has equated to "theme" information. *See* SONOS-SVG2-00067584-88 (defining "theme" as any "topic of discourse or discussion" or as any "idea or topic expanded in a discourse, discussion, etc").

85. Regardless, at a minimum, Google's Cast technology indisputably provides the capability to assign ***any*** desired name for a speaker group – including the exact same types of time-based or area-based names that Google has acknowledged to be "theme" information. N.D. Cal. Case No. 3:21-cv-7559, D.I. 64 at 12-15.

86. For instance, as one possibility, Google's Cast technology allows for speaker groups that are named according to a specific time of day, such as a "Morning" speaker group comprising Accused Google Players on which the user wishes to listen to audio in synchrony in the morning or an "Afternoon" speaker group comprising Accused Google Players on which the user wishes to listen to audio in synchrony in the afternoon. As another possibility, Google's Cast technology allows for speaker groups that are named according to a specific area of the user's home, such as an "Upstairs" speaker group comprising Accused Google Players located in the upstairs of the user's home, a "Downstairs" speaker group comprising Accused Google Players located in the downstairs of the user's home, or an "Outside" speaker group comprising Accused Google Players located in outdoor areas of the user's home. At a minimum, these examples of speaker groups are "according to a common theme" by Google's own prior admission.

87. Various evidence that I have reviewed during my infringement analysis confirms that Google's Cast technology provides the capability to create and save speaker groups that are named "according to a common theme" as Google itself has interpreted that phrase – including but not limited to time-based names or area-based names. *See, e.g.*, GOOG-SONOSNDCA-00056732-77 at 56 ([redacted]); SONOS-SVG2-00067567-83

(describing examples of speaker groups named "upstairs," "downstairs," and "deck"); SONOS-SVG2-00067561-66 ("Under **Name this speaker group**, type a name ('Whole House' or 'Living Room,' etc.) and tap **Save**.") (emphasis in original); GOOG-SONOSNDCA-00057440-43 at 40 (Google listing "Bedroom speakers" as an example of a speaker group that could be used for playback).

88. As discussed above, during testing, I also observed this capability to create speaker groups that are named "according to a common theme" as Google itself interprets that phrase, including but not limited to time-based and/or area-based names. For instance, as discussed above, Google's Cast technology provided the capability to create and save speaker groups having names of "Morning" and "Evening," among others not shown in the screenshots above. *See* Section IX.

89. This capability of the Accused Google Players to be included in Google speaker groups (that can be invoked for synchronous playback) having time-based or area-based names is itself sufficient to satisfy the "zone scene" limitations, because Claim 1 of the '885 Patent is directed to a "zone player" with software that provides the zone player with the ***capability*** to be included in "zone scenes" (that can be invoked for synchronous playback). Whether or not the there is an ***additional*** capability of the Accused Google Players to be included in Google speaker groups having names that are allegedly not "theme" information is irrelevant to the question of whether the Accused Google Players satisfy the "zone scene" limitations.

90. Thus, for at least the above reasons, it is my opinion that a Google speaker group is a "zone scene" under either party's proposed construction of that term.

B. Limitation-by-Limitation Analysis and Opinions

1. Claim Limitation 1.0

91. The preamble of claim 1 of the '885 Patent requires a "first zone player."

92. With respect to claim construction, I understand that the parties agree that the term "zone player" has the same meaning as the term "playback device" (which appears in other Sonos patents). However, the parties disagree as to what that meaning is.

93. Sonos's proposed construction of "zone player" as that term is used in the '885 Patent (which also applies to the term "playback device" in other Sonos patents) is a "data network

device configured to process and output audio," which is the same construction of "zone player" that Sonos and Google agreed to use in the prior ITC investigation. And related to this proposed construction, Sonos's interpretation of the plain and ordinary meaning of the term "data network" is "a medium that interconnects devices, enabling them to send digital data packets to and receive digital data packets from each other." I agree with Sonos that this is how a person of ordinary skill in the art ("POSITA") would understand the plain and ordinary meaning of the term "data network" in the context of the '885 Patent, and a detailed discussion of the reasons why I agree with Sonos's interpretation of the plain and ordinary meaning of the term "data network" is set forth in the Declaration of Kevin C. Almeroth that I submitted on April 27, 2021 in the Western District of Texas prior to the case being transferred. *See* N.D. Cal. Case No. 3:21-cv-7559, D.I. 60-25 at 16-29 (June 29, 2021).

94. On the other hand, Google disagrees with Sonos's proposed construction and argues that "zone player" should be given its plain and ordinary meaning, and that no construction is necessary. *See* D.I. 200 at 7-11. In this respect, Google appears to agree with that a "zone player" is a device configured to "output audio," but disputes that a "zone player" is restricted to a "data network device" or a device that is "configured to process . . . audio." *Id.*

95. In my opinion, each Accused Google Player is a "zone player" under either party's proposed construction of that term.

96. As an initial matter, each Accused Google Player is an audio player that is capable of outputting audio either in the form of sound from built-in speakers or in the form of an audio signal that is provided to a connected, external device with speakers. *See* Google's Resp. to Sonos's RFA No. 4 ([redacted]). In particular, each Home, Home Mini, Home Max, Nest Audio, Nest Mini, Nest Hub (formerly branded as the Home Hub), Nest Hub Max, and Nest Wifi Point is configured to output audio in the form of sound from one or more built-in speakers, while each Chromecast, Chromecast Ultra, and Chromecast with Google TV is configured to output audio in the form of an audio signal that

is provided to a connected external device with speakers, such as a TV. *See* Google's Resp. to Sonos's RFA No. 5; SONOS-SVG2-00060265; SONOS-SVG2-00060233; SONOS-SVG2-00060242; SONOS-SVG2-00055114; *see also* Sections VIII-IX.

97. Based on this audio output capability alone, it is my opinion that each Accused Google Player is a "first zone player" under Google's proposed interpretation of "zone player."

98. In addition, each Accused Google Player satisfies the additional aspects of Sonos's proposed construction of "zone player."

99. For instance, each Accused Google Player is capable of connecting to and communicating over a Wi-Fi network. *See* Google's Resp. to Sonos's RFA No. 9 ([redacted]"); *see also, e.g.*, Exhibit 2 (summarizing evidence showing that each Accused Google Player [redacted]); *see also* Sections VIII-IX. In this respect, a Wi-Fi network is commonly understood by POSITAs to be an example of a "data network," because it serves as a medium for interconnecting devices in a manner that enables them to send digital data packets to and receive digital data packets from each other. Thus, each Accused Google Player is a "data network device" as required by Sonos's proposed construction.

100. Further, each Accused Google Player is capable of [redacted] *See, e.g.*, GOOG-SONOSWDTX-00051153-56 at 53; GOOG-SONOSWDTX-00048731-55 at 38; GOOG-SONOSWDTX-00048510-12 at 10; GOOG-SONOSWDTX-00048973-83 at 75-76; Exhibit 2 (summarizing evidence showing audio processors of the Accused Google Players); *see also* Sections VIII-IX. As such, each Accused Google Player is "configured to process and output audio" as required by Sonos's proposed construction.

101. Thus, each Accused Google Player is a "first zone player" under Sonos's proposed construction of "zone player."

2. Claim Limitations 1.1-1.4

102. Claim limitations 1.1-1.4 of the '885 Patent require the "first zone player" to include the following hardware components: **[1.1]** "a network interface that is configured to communicatively couple the first zone player to at least one data network"; **[1.2]** "one or more processors"; and **[1.3]** "a non-transitory computer-readable medium" having **[1.4]** "program instructions" stored thereon that, "when executed by the one or more processors, cause the first zone player to perform" the functions recited in claim 1 of the '885 Patent.

103. With respect to claim construction, I understand that the parties agree that the term "network interface" should be interpreted to have its plain and ordinary meaning. However, the parties disagree as to what that plain and ordinary meaning is.

104. Sonos's interpretation of the plain and ordinary meaning of the term "network interface" is "a physical component of a device that provides an interconnection with a data network," which tracks the construction of "network interface" that Sonos and Google agreed to use in the prior ITC investigation. And as I mentioned above, Sonos's interpretation of the plain and ordinary meaning of the term "data network" is "a medium that interconnects devices, enabling them to send digital data packets to and receive digital data packets from each other," which is consistent with how a POSITA would understand the plain and ordinary meaning of the term "data network" in the context of the '885 Patent.

105. On the other hand, Google disagrees with Sonos's interpretation of the plain and ordinary meaning of the term "network interface" and maintains that it should be interpreted consistently with Google's position in the Western District of Texas, where Google argued that a "network interface" does not have to be a "physical" component and does not have to provide an interconnection with "a data network." *See* N.D.Cal. Case No. 2:21-cv-7559, D.I. 64 at 4-5; N.D. Cal. Case No. 2:21-cv-7559, D.I. 81 at 2 n.2 (June 29, 2021).

106. As far as I am aware, neither party has asked for construction of any other term included in claim limitations 1.1-1.4 besides the "network interface" term and "zone player," which I addressed above in Section X.B.1.

107. In my opinion, each Accused Google Player includes the hardware components

required by claim limitations 1.1-1.4 under either parties' interpretation of the plain and ordinary meaning of the term "network interface."

108. First, each Accused Google Player includes [redacted] *See* Google's Resp. to Sonos's RFA No. 9 ([redacted]); Exhibit 2 (summarizing evidence showing that each Accused Google Player [redacted]); 9/11/2020 J. West Dep. Tr. from ITC Inv. No. 337-TA-1191 at 224:1-24 ([redacted]); *see also* Sections VIII-IX. And as already explained above, a Wi-Fi network is a "data network." Thus, each Accused Google Player includes "a network interface that is configured to communicatively couple the [Accused Google Player] to at least one data network" under either party's interpretation of "network interface."

109. Second, each Accused Google Player includes at least [redacted] *See* Google's Resp. to Sonos's RFA No. 2 ([redacted]); Exhibit 2 (summarizing evidence showing that each Accused Google Player includes [redacted]); *see also* Sections VIII-IX. Thus, each Accused Google Player includes "one or more processors."

110. Third, each Accused Google Player includes [redacted] *See* Google's Resp. to Sonos's RFA No. 3 ([redacted]); Exhibit 2 (summarizing evidence showing that each Accused Google Player [redacted]); Google Resp. to Sonos Interrog. No. 5 at 11-13 (setting forth a chart of firmware versions for the Accused Google Players); 10/1/2020 K. MacKay Dep. Tr. from ITC Inv. No. 337-TA-1191 at 67:22-71:1 ([redacted]

[redacted]); *see also* Sections VIII-IX. Thus, each Accused Google Player includes "a non-transitory computer-readable medium" having "program instructions" stored thereon that, "when executed by the one or more processors, cause the [Accused Google Player] to perform" the functions discussed below, which meet the functional limitations of claim 1 of the '885 Patent.

111. Thus, for at least the above reasons, it is my opinion that each Accused Google Player meets claim limitations 1.1-1.4 of claim 1 of the '885 Patent.

3. Claim Limitations 1.5-1.7

112. Claim limitations 1.5-1.7 of the '885 Patent require the "first zone player" to be encoded with executable "program instructions" that cause the Accused Google Player to:

> **[1.5]** while operating in a standalone mode in which the first zone player is configured to play back media individually in a networked media playback system comprising the first zone player and at least two other zone players:
>
> > **[1.6]** (i) receiv[e], from a network device over a data network, a first indication that the first zone player has been added to a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked; and
> >
> > **[1.7]** (ii) receiv[e], from the network device over the data network, a second indication that the first zone player has been added to a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the second zone player is different than the third zone player;

113. As far as I am aware, neither party has asked for construction of any term included in claim limitations 1.5-1.7 other than "zone player" and "zone scene," which I addressed above in Sections X.A and X.B.1.

114. In order to meet these claim limitations, an Accused Google Player must be programmed with the functional capability to:

- Participate in a "networked media playback system" comprising the Accused Google Player and at least two other Accused Google Players;
- Operate in a "standalone mode" in which the Accused Google Player "is configured to play back media individually" while in the "networked media playback system"; and
- While operating in the "standalone mode," receive, from a "network device" over a "data network," (i) a "first indication" that the Accused Google Player has been added

to a "first zone scene," which includes the Accused Google Player and a second Accused Google Player and (ii) a "second indication" that the Accused Google Player has been added to a "second zone scene," which includes the Accused Google Player and a third Accused Google Player that differs from the second Accused Google Player.

115. In my opinion, each Accused Google Player is programmed with the functional capability required by claim limitations 1.5-1.7.

116. ***First***, each Accused Google Player is capable [redacted]. *See, e.g.*, GOOG-SONOSWDTX-00005732 at 56 ([redacted]); GOOG-SONOSWDTX-00007068-74 at 68 [redacted]). During testing, I also observed this capability for each Accused Google Player [redacted]. *See* Section IX.

117. ***Second***, each Accused Google Player is programmed such that, after being set up, the Accused Google Player [redacted] *See* GOOG-SONOSWDTX-00048731-55 at 47 [redacted] Thus, each Accused Google Player is programmed with the functional capability to operate in a "standalone mode" in which the Accused Google Player "is

configured to play back media individually" (rather than as part of a group).

118. In particular, each Home, Home Mini, Home Max, Nest Audio, Nest Mini, Nest Hub (formerly brand as the Home Hub), Nest Hub Max, and Nest Wifi Point is capable of operating in a "standalone mode" in which it is configured to play back media individually (rather than as part of a group) by virtue of processing and outputting audio in the form of sound from one or more built-in speakers, while each Chromecast, Chromecast Ultra, and Chromecast with Google TV is capable of operating in a "standalone mode" in which it is configured to play back media individually (rather than as part of a group) by virtue of processing and outputting audio in the form of an audio signal that is provided to a connected external device with speakers (such as a TV). *See* Google's Resps. to Sonos's RFA Nos. 4-5; SONOS-SVG2-00060265; SONOS-SVG2-00060233; SONOS-SVG2-00060242; SONOS-SVG2-00055114.

119. In fact, "standalone mode" is the default operating mode for any Accused Google Player. Specifically, after being set up, an Accused Google Player will always begin in a "standalone mode" in which the Accused Google Player "is configured to play back media individually," and will remain in that "standalone mode" unless and until a group that includes the Accused Google Player is created, saved, and then subsequently [redacted] at which point the Accused Google Player will transition from the standalone mode to a grouped mode. Thereafter, the Accused Google Player is operable to transition back and forth between the standalone mode and the grouped mode depending on how the users interact with the Google system.

120. This capability of each Accused Google Player to operate in a "standalone mode" in which the Accused Google Player "is configured to play back media individually" is confirmed by Google's own documents. *See, e.g.*, GOOG-SONOSWDTX-00005793-802 at 93 ([redacted]); GOOG-SONOSNDCA-00056732-77 at 41, 48, 61 ([redacted]). Additionally, during testing, I observed this capability of each Accused Google Player to operate in a "standalone mode" in which the Accused Google Player "is configured to play back media individually." *See* Section IX.

121. ***Third***, each Accused Google Player is programmed such that, [redacted]

[redacted]

122. In this respect, I have already explained above that each Accused Google Player is a "zone player," each Google speaker group is a "zone scene" comprising a "predefined grouping of zone players … that are to be configured for synchronous playback of media when the . . . zone scene is invoked," and a Wi-Fi network is a "data network." Additionally, a Google Controller is a "network device" because it is configured to connect to and communicate over a data network, such as a Wi-Fi network. Thus, this functional capability of the Accused Google Players satisfies the requirement that the "first zone player" be capable of receiving, from a "network device" over a "data network" while operating in the "standalone mode," (i) "a first indication that the first zone player has been added to a first zone scene comprising a first predefined grouping of zone players including at least the first zone player and a second zone player that are to be configured for synchronous playback of media when the first zone scene is invoked" and (ii) "a second indication that the first zone player has been added to a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein

the second zone player is different than the third zone player."

123. Various evidence that I have reviewed during my infringement analysis confirms that each Accused Google Player is programmed to function in this manner. For instance, in Google's Third Supplemental Response to Sonos's Interrogatory No. 13, [redacted] Google's Third Suppl. Resp. to Sonos's Interrog. No. 13 at 9; *see also*, *e.g.*, GOOG-SONOSWDTX-00048962-66 at 62 ([redacted]); GOOG-SONOSWDTX-00007068-74 at 68 ([redacted]); SONOS-SVG2-00055660-61 (same); GOOG-SONOSNDCA-00056732-77 at 56 [redacted]).

124. I have also confirmed this functional capability in the Google source code. For instance, the following exemplary source code [redacted]

125. Correspondingly, the following exemplary source code for the Google Home app for Android shows [redacted]

[redacted]

126. The functions provided by the foregoing source code [redacted] while an Accused Google Player is operating in a "standalone mode."

127. Lastly, as discussed above, I observed during testing that a Google Controller can be used to add an Accused Google Player to multiple different speaker groups having different members. *See* Section IX.

128. Thus, for at least the above reasons, it is my opinion that each Accused Google Player meets claim limitations 1.5-1.7 of claim 1 of the '885 Patent.

4. Claim Limitation 1.8

129. Claim limitation 1.8 of the '885 Patent requires the "first zone player" to be encoded with executable "program instructions" that cause the Accused Google Player to:

> **[1.8]** after receiving the first and second indications, continuing to operate in the standalone mode until a given one of the first and second zone scenes has been selected for invocation;

130. As far as I am aware, neither party has asked for construction of any term included in claim limitation 1.8 other than "zone player" and "zone scene," which I addressed above in Sections X.A and X.B.1.

131. In my opinion, each Accused Google Player is programmed with the functional capability required by claim limitation 1.8.

132. As discussed above, each Accused Google Player is programmed such that, while [redacted]

[redacted] – which satisfies claim limitation 1.8.

133. Various evidence that I have reviewed during my infringement analysis confirms that each Accused Google Player is programmed to function in this manner. For instance, various Google documents [redacted] *See, e.g.*, GOOG-SONOSWDTX-00048962-66 at 64-65 ([redacted]); GOOG-SONOSWDTX-00040384-96 at 84-89 ([redacted]); GOOG-SONOSWDTX-00048792-838 at 802 ([redacted]); GOOG-SONOSNDCA-00056732-77 at 56-62 ([redacted]).

134. As explained above, I likewise confirmed during testing that the act of [redacted]

[redacted] *See* Section IX.

135. Thus, for at least the above reasons, it is my opinion that each Accused Google Player meets claim limitation 1.8 of claim 1 of the '885 Patent.

5. Claim Limitation 1.9

136. Claim limitation 1.9 of the '885 Patent requires the "first zone player" to be encoded with executable "program instructions" that cause the Accused Google Player to:

> **[1.9]** after the given one of the first and second zone scenes has been selected for invocation, receiving, from the network device over the data network, an instruction to operate in accordance with a given one of the first and second zone scenes respectively comprising a given one of the first and second predefined groupings of zone players;

137. As far as I am aware, neither party has asked for construction of any term included in claim limitation 1.9 other than "zone player" and "zone scene," which I addressed above in Sections X.A and X.B.1.

138. In my opinion, each Accused Google Player is programmed with the functional capability required by claim limitation 1.9.

139. For instance, [redacted]

[redacted]

140. I have already explained above that each Accused Google Player is a "zone player," each speaker group is a "zone scene" comprising a "predefined grouping of zone players … that are to be configured for synchronous playback of media when the . . . zone scene is invoked," a Wi-Fi network is a "data network," and a Google Controller is a "network device." Thus, this functional capability of the Accused Google Players satisfies the requirement that the "first zone player" have the functional capability to receive, from the "network device" over the "data network" after "the given one of the first and second zone scenes has been selected for invocation," "an instruction to operate in accordance with a given one of the first and second zone scenes respectively comprising a given one of the first and second predefined groupings of zone players."

141. Various evidence that I have reviewed during my infringement analysis confirms that each Accused Google Player is programmed to function in this manner. For instance, in Google's Third Supplemental Response to Sonos's Interrogatory No. 13, Google explains that [redacted] *See, e.g.*, Google's Third Suppl. Resp. to Sonos's Interrog. No. 13 at 9-10.

142. Further, various Google documents confirm that, [redacted] *See, e.g.*, GOOG-SONOSWDTX-00048962-66 at 64-65 ([redacted]); GOOG-SONOSWDTX-00038533-79 at 46-48 ([redacted] GOOG-SONOSWDTX-00040384-96 at 88, 92 ([redacted]); GOOG-

SONOSNDCA-00056732-77 at 58-62 ([redacted]

143. I have also confirmed this functional capability in the Google source code. For instance, the following exemplary source code [redacted]

See also Google's Third Suppl. Resp. to Sonos's Interrogatory No. 13 at 10 (stating that [redacted]).

144. Correspondingly, the following exemplary source code for the Google Home app for Android, the YouTube Music app for Android, and the Google Play Music app for Android shows that [redacted]

Google Home app for Android

- [redacted]

YouTube Music app for Android

- [redacted]

Google Play Music app for Android

- [redacted]

145. [redacted]

146. Lastly, as discussed above, I observed during testing that when a particular speaker group [redacted]. *See* Section IX.

147. Thus, for at least the above reasons, it is my opinion that each Accused Google Player meets claim limitation 1.9 of claim 1 of the '885 Patent.

6. Claim Limitation 1.10

148. Claim limitation 1.10 of the '885 Patent requires the "first zone player" to be encoded with executable "program instructions" that cause the Accused Google Player to:

> **[1.10]** based on the instruction, transitioning from operating in the standalone mode to operating in accordance with the given one of the first and second predefined groupings of zone players such that the first zone player is configured to coordinate with at least one other zone player in the

> given one of the first and second predefined groupings of zone players over a data network in order to output media in synchrony with output of media by the at least one other zone player in the given one of the first and second predefined groupings of zone players.

149. As far as I am aware, neither party has asked for construction of any term included in claim limitation 1.10 other than "zone player" and "zone scene," which I addressed above in Sections X.A and X.B.1.

150. In my opinion, each Accused Google Player is programmed with the functional capability required by claim limitation 1.10.

151. To begin, as discussed above, each Accused Google Player is programmed [redacted]

152. I have already explained above that each Accused Google Player is a "zone player," each speaker group is a "zone scene" comprising a "predefined grouping of zone players … that are to be configured for synchronous playback of media when the . . . zone scene is invoked," and a Wi-Fi network is a "data network." Thus, this functional capability of the Accused Google Players satisfies the requirement that the "first zone player" have the functional capability to

"based on the instruction, transition[] from operating in the standalone mode to operating in accordance with the given one of the first and second predefined groupings of zone players such that the first zone player is configured to coordinate with at least one other zone player in the given one of the first and second predefined groupings of zone players over a data network in order to output media in synchrony with output of media by the at least one other zone player in the given one of the first and second predefined groupings of zone players."

153. Various evidence that I have reviewed during my infringement analysis confirms that each Accused Google Player is programmed to function in this manner.

154. For instance, in Google's Third Supplemental Response to Sonos's Interrogatory No. 13, Google explains that [redacted] *See, e.g.*, Google's Third Suppl. Resp. to Sonos's Interrog. No. 13 at 9-10.

155. Further, various Google documents confirm that each Accused Google Player is programmed to function in the manner required by claim limitation 1.10. For example, Google documents confirm [redacted]

156. As another example, Google documents confirm that while an Accused Google Player is [redacted]

[redacted]

157. As yet another example, various Google documents confirm [redacted]

158. I have also confirmed this functional capability in the Google source code. For instance, [redacted]

159. [redacted]

160. Lastly, as discussed above, I observed during testing that when a speaker group was selected at a Google Controller, the Google Controller shows a visual indication (and for some apps also an audible indication) that the Accused Google Players in the selected speaker group have begun to operate in accordance with that speaker group, and when the selected speaker group began to engage in active playback, it sounded to me as though each Accused Google Player in the selected speaker group was outputting audio in synchrony with one another. *See* Section IX.

161. Thus, for at least the above reasons, it is my opinion that each Accused Google Player meets claim limitation 1.10 of claim 1 of the '885 Patent.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Dated: April 14, 2022

By: Kevin C Almeroth

Kevin C. Almeroth

EXHIBIT 1

EXHIBIT 1 – MATERIALS CONSIDERED BY KEVIN C. ALMEROTH

- U.S. Patent No. 10,848,885 ("the '885 Patent"), prosecution history, including the patents and file histories in priority chain
- Sonos's Supp. Infringement Contention Chart for the '885 Patent, dated Jan. 20, 2022
- Claim Construction materials in the present case, including Joint Claim Construction and Pre-Hearing Statement (Dkt. No. 126), Sonos, Inc.'s Opening Claim Construction Brief and exhibits thereto (Dkt. No. 184), Google LLC's Responsive Claim Construction Brief and exhibits thereto (Dkt. No. 200), Sonos, Inc.'s Reply Claim Construction Brief and exhibits thereto (Dkt. No. 202), Markman Hearing Transcript, dated Aug. 10, 2021
- Claim Construction materials from *Sonos, Inc. v. Google LLC*, No. 3:21-cv-7559 (N.D. Cal.) (previously No. 6:21-cv-881 (W.D. Tex.), including Sonos's Opening Claim Construction Brief and exhibits thereto (Dkt. No. 60), Google's Responsive Claim Construction Brief and exhibits thereto (Dkt. No. 64), Sonos's Reply Claim Construction Brief and exhibits thereto (Dkt. No. 66), Google's Sur-Reply Claim Construction Brief and exhibits thereto (Dkt. No. 81), Joint Claim Construction Statement (Dkt. No. 94)
- Google's discovery responses, including Google's Third Supp Objs & Resps to Sonos's First Set of Rog Nos. 13-15 (dated Feb. 4, 2022), Google's Fourth Supp. Objs & Resps to Sonos's First Set of Rog Nos. 5, 9, 17 (dated Apr. 5, 2022), Google's Fifth Supp. Objs & Resps to Sonos's First Set of ROG No. 12 (dated Apr. 7, 2022), Google's Objs & Resps to Sonos 1st Set of RFAs (dated Apr. 8, 2022)
- Prior testimony from ITC Inv. No. 337-TA-1191, including Deposition Transcripts of Ken MacKay and James West
- Google's source code made available for inspection, including printouts of certain portions
- Examples of Accused Google Players and Google Controllers
- Internal and publicly-available documents, including the following:

GOOG-SONOSNDCA-00056732	GOOG-SONOSWDTX-00048962
GOOG-SONOSNDCA-00057440	GOOG-SONOSWDTX-00048973
GOOG-SONOSWDTX-00005229	GOOG-SONOSWDTX-00051153
GOOG-SONOSWDTX-00005732	SONOS-SVG2-00055112
GOOG-SONOSWDTX-00005793	SONOS-SVG2-00055113
GOOG-SONOSWDTX-00007068	SONOS-SVG2-00055114
GOOG-SONOSWDTX-00038533	SONOS-SVG2-00055660
GOOG-SONOSWDTX-00040384	SONOS-SVG2-00060233
GOOG-SONOSWDTX-00048393	SONOS-SVG2-00060242
GOOG-SONOSWDTX-00048510	SONOS-SVG2-00060265
GOOG-SONOSWDTX-00048731	SONOS-SVG2-00067561
GOOG-SONOSWDTX-00048792	SONOS-SVG2-00067567
GOOG-SONOSWDTX-00048959	SONOS-SVG2-00067584
All documents cited in Exhibit 2	

EXHIBIT 2

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

EXHIBIT 2 – CHART SUMMARIZING EVIDENCE FOR HARDWARE ELEMENTS

Accused Google Player	"Network Interface"	"One or More Processors"	"Non-transitory computer-readable medium"
Chromecast (3rd Gen)	[redacted]		
Chromecast (4th Gen)			
Chromecast Ultra			
Chromecast with Google TV			
Home			
Home Mini			

EXHIBIT 2 – CHART SUMMARIZING EVIDENCE FOR HARDWARE ELEMENTS

Home Max	[redacted]
Nest Audio	
Nest Mini	
Nest Hub (f/k/a Home Hub)	
Nest Hub Max	
Nest WiFi Point	